

member selected from the group consisting of cyclodextrin and derivatives thereof,  
whereby micelles of HDL and VLDL cholesterol are formed in said micelle layer;

a hydrophobic barrier in fluid communication with said micelle layer, said  
hydrophobic barrier substantially trapping therein the micelles of HDL and VLDL  
5 cholesterol formed in said micelle layer; and

a reaction layer in fluid communication with said hydrophobic barrier,  
said reaction layer containing a cholesterol determining agent, whereby the  
cholesterol measurement obtained in said reaction layer substantially corresponds to  
the concentration of LDL cholesterol in the sample.

10 ~~2~~<sup>2</sup>. The apparatus of claim ~~1~~<sup>1</sup>, wherein at least one of said cyclodextrin and derivatives  
thereof is selected from the group consisting of alkyl betaine derivatives,  
sulfobetaine derivatives, aminocarboxylic acid derivatives, imidazoline  
derivatives, amino oxide and ethoxylated acetylene derivatives.

15 ~~3~~<sup>3</sup>. The apparatus of claim ~~1~~<sup>1</sup>, wherein said non-ionic surfactant comprises at least one  
compound selected from the group consisting of an aminocarboxylic acid  
derivative, lauric acid amidopropyl betaine, a 2-alkyl-N-carboxymethyl-N-  
hydroxyethyl imidazolium betaine lauryl betaine, sodium N-lauryl-N-methyl-  
beta-alanine and N-octyl-N,N-dimethyl-3-amminio-1-propanesulfonic acid.

20 ~~4~~<sup>4</sup>. The apparatus of claim ~~1~~<sup>1</sup>, wherein said cyclodextrin and derivatives thereof is  
poly-beta-cyclodextrin.

~~5~~<sup>5</sup>. The apparatus of claim ~~1~~<sup>1</sup>, wherein at least one of said cyclodextrin and  
derivatives thereof is selected from the group consisting of dimethyl-alpha-  
cyclodextrin and poly-beta-cyclodextrin.

<sup>1</sup>  
6. The apparatus of claim <sup>1</sup>7, wherein said hydrophobic barrier comprises an asymmetric membrane.

<sup>7</sup>  
7. The apparatus of claim <sup>6</sup>8, wherein said hydrophobic barrier is coated with casein.

<sup>8</sup>  
8. The apparatus of claim <sup>1</sup>9, wherein said hydrophobic barrier is coated with casein.

5 <sup>9</sup>  
9. The apparatus of claim <sup>1</sup>10, wherein said hydrophobic barrier comprises a polyether sulphone membrane.

<sup>10</sup>  
10. The apparatus of claim <sup>1</sup>11, wherein said hydrophobic barrier includes at least one compound selected from the group consisting of sorbitol, sucrose and tween 20.

<sup>11</sup>  
11. A method of determining concentration of LDL cholesterol in a whole blood

10 sample, said method comprising:

(a) contacting the whole blood sample with a first layer, separating blood cells from plasma in the first layer and passing the plasma therethrough;

15 (b) contacting the plasma which passed through the first layer with a second layer, forming micelles of HDL and VLDL but not LDL cholesterol in the second layer and passing the plasma including micelles through the second layer;

20 (c) contacting the plasma containing the micelles with a third layer and trapping the micelles in the third layer while passing the plasma now substantially devoid of HDL and VLDL cholesterol therethrough; and

(d) contacting the plasma now substantially devoid of HDL and VLDL cholesterol with a fourth layer that has been incorporated with a cholesterol determining agent, whereby the cholesterol measurement

obtained in the fourth layer substantially corresponds to the  
concentration of LDL cholesterol in the sample.

<sup>12</sup>  
12. The method of claim <sup>11</sup>~~11~~, further comprising prior to step (a) treating the second  
layer with a non-ionic surfactant and at least one member selected from the group  
consisting of cyclodextrin and derivatives thereof.

<sup>13</sup>  
13. The method of claim <sup>11</sup>~~11~~, further comprising prior to step (a) coating the third  
layer with casein.

<sup>14</sup>  
14. The method of claim <sup>11</sup>~~11~~, further comprising prior to step (a) selecting a polyether  
sulphone membrane for the third layer.

<sup>15</sup>  
10 15. The method of claim <sup>11</sup>~~11~~, further comprising prior to step (a) selecting an  
asymmetric membrane for the third layer.

<sup>16</sup>  
16. A method of determining cholesterol concentration in a whole blood sample, said  
method comprising:

(a) contacting the whole blood sample with a first layer, separating blood  
15 cells from plasma in the first layer and passing the plasma  
therethrough; and

(b) contacting the plasma obtained in step (a) with a reaction layer  
incorporated with a cholesterol determining agent and CHAPS.

<sup>17</sup>  
17. The method of claim <sup>16</sup>~~16~~, further comprising prior to step (b), incorporating MES  
20 buffer in the cholesterol determining agent.